

**STATE OF ALASKA**  
**ALASKA OIL AND GAS CONSERVATION COMMISSION**  
**333 West 7<sup>th</sup> Avenue**  
**Anchorage Alaska 99501**

Re: THE APPLICATION OF BP Exploration ) Docket Number: AIO-15-032  
(Alaska) Inc. for amendments to Area ) Area Injection Order No. 3B  
Injection Order 3A to authorize the injection )  
of carbon dioxide effluent from the proposed ) Prudhoe Bay Unit  
Alaska LNG Project gas treatment plant for ) Western Operating Area including  
the purposes of enhanced oil recovery, and ) the K Pad Area  
the request from ConocoPhillips Alaska Inc. ) Prudhoe Oil Pool  
to authorize disposal of the carbon dioxide ) North Slope Borough, Alaska  
effluent. )  
) October 15, 2015

**IT APPEARING THAT:**

1. By application received July 17, 2015, BP Exploration (Alaska) Inc. (BPXA) on behalf of itself and ExxonMobil Alaska Production Inc. (ExxonMobil) as working interest owners (WIOs) in the Prudhoe Bay Unit (PBU) requested that Area Injection Order (AIO) 3A be amended to allow the injection of carbon dioxide (CO<sub>2</sub>) for enhanced recovery and pressure maintenance purposes from sources inside and outside the PBU.
2. Pursuant to 20 AAC 25.540, the Alaska Oil and Gas Conservation Commission (AOGCC) scheduled a public hearing for August 27, 2015. On July 20, 2015, the AOGCC published notice of that hearing on the State of Alaska's Online Public Notice website and on the AOGCC's website, electronically transmitted the notice to all persons on the AOGCC's email distribution list, and mailed printed copies of the Notice of Public Hearing to all persons on the AOGCC's mailing distribution list. On July 21, 2015, the notice was published in the ALASKA DISPATCH NEWS.
3. On July 23, 2015, the AOGCC published notice of that the location of the hearing had changed on the State of Alaska's Online Public Notice website and on the AOGCC's website, electronically transmitted the notice to all persons on the AOGCC's email distribution list, and mailed printed copies of the Notice of Public Hearing to all persons on the AOGCC's mailing distribution list. On July 24, 2015, the notice was published in the ALASKA DISPATCH NEWS.
4. By letter received August 19, 2015, ConocoPhillips Alaska, Inc. (CPAI) on behalf of itself and Chevron U.S.A. Inc. (Chevron) as PBU WIOs supported BPXA's request to allow the injection of CO<sub>2</sub> for enhanced recovery purposes, but also asked for authorization to dispose of the CO<sub>2</sub> in the event that CO<sub>2</sub> is not shown to provide any enhanced oil recovery benefit.
5. On August 25, 2015, the AOGCC received pre-filed written testimony from BPXA.
6. On August 27, 2015, the AOGCC received a letter from ExxonMobil supporting BPXA's application.

7. The hearing commenced at 9:00 AM on August 27, 2015, in the Alaska State Legislature Building, Legislative Information Office located at 716 West 4th Avenue, Anchorage, Alaska.
8. Testimony was received from representatives of BPXA, CPAI, and Mr. Tom Lakosh, a private citizen.
9. The record was held open until September 8, 2015 for responses to requests made by the AOGCC at the public hearing.
10. The AOGCC received written comments from Mr. Lakosh on August 27, 2015, requested additional information from CPAI on September 3, 2015, and requested additional information from BPXA on September 8, 2015.
11. By email sent September 4, 2015, the AOGCC requested CPAI provide further justification for its request to dispose of CO<sub>2</sub>. CPAI responded that same day.

#### **FINDINGS:**

1. Operator and Owners: BPXA is the operator of the leases in the portion of the PBU within the Affected Area of this order. BPXA, ExxonMobil, CPAI, and Chevron are the WIOs, and the State of Alaska, Department of Natural Resources (DNR) is the landowner of the Affected Area, which is located within the North Slope Borough, along Alaska's northern coastline.
2. Affected Area: The Affected Area is defined in AIO 3A, and it remains unchanged for this amended order.
3. AOGCC Authority: The U.S. Environmental Protection Agency (EPA) has granted the AOGCC regulatory primacy limited to underground injection control (UIC) Class II wells.
4. Source of CO<sub>2</sub> Effluent: The proposed Alaska Liquefied Natural Gas Project (AK LNG) includes a North Slope gas treatment plant (GTP) to process produced gas from multiple fields to sales specifications prior to shipment to the proposed LNG plant in south-central Alaska. The GTP will remove significant amounts of impurities from the produced gas—primarily CO<sub>2</sub>—prior to shipment for sales. The resulting effluent stream from the GTP is expected to contain more than 99% CO<sub>2</sub>, and it will be sent back to the PBU for injection.
5. BPXA Request: BPXA requests that AIO 3A be amended to authorize the injection of the portion of the effluent stream that is sourced from fields outside of the PBU for enhanced oil recovery (EOR) purposes. AIO 3A currently authorizes injection of produced gas that originates within the PBU.
6. CPAI Request: CPAI supports BPXA's request for authorization to inject the GTP effluent stream for EOR purposes, but is additionally requests authorization to dispose of the GTP effluent stream if it is determined there is no EOR benefit to injecting that effluent stream into the Prudhoe Oil Pool (POP). CPAI also requests AIO 3A be amended to permit administrative approval of future modifications.
7. EOR Potential of CO<sub>2</sub>: Under the right conditions, mixtures of CO<sub>2</sub> and the hydrocarbon miscible injectant already in use for EOR purposes within the PBU will be miscible with the crude oil and thus provide an EOR benefit. In the event that mixtures containing CO<sub>2</sub> are

not miscible, injecting the CO<sub>2</sub>-bearing effluent stream will improve oil recovery by maintaining reservoir pressure.

8. CO<sub>2</sub> Disposal: According to the EPA, CO<sub>2</sub> can be disposed of in Class II wells when those wells were previously used for a CO<sub>2</sub> EOR injection project. Disposal of CO<sub>2</sub> under other circumstances requires Class VI wells, which are administered by the EPA.
9. Administrative Relief: Rule 10 of AIO 3A provides for administratively amending the order if certain conditions are met, but is an older form of the rule than the AOGCC currently uses.

**CONCLUSIONS:**

1. Amendment of AIO 3A is necessary to authorize the injection of outside substances.
2. Injection of the effluent stream from the AK LNG GTP in the Prudhoe Oil Pool will improve recovery and minimize waste.
3. CPAI's proposed disposal injection of CO<sub>2</sub>-bearing effluent derived from the GTP requires use of UIC Class VI wells, which are under the jurisdiction of the EPA.
4. AIO 3A's administrative relief rule should be revised to be consistent with the AOGCC's current practices.

**NOW, THEREFORE, IT IS ORDERED:**

AIO 3 and AIO 3A and all associated administrative approvals (except AIO 003.011, AIO 003.012, AIO 003.016, AIO 003.019, AIO 003.022, AIO 003.024, AIO 003.029, and AIO 003.030, which remain in effect) are hereby revoked and replaced by this order. All information related to AIO 3 and AIO 3A is hereby incorporated by reference into the record for this order. The following rules, in addition to the statewide requirements under 20 AAC 25 (to the extent not superseded by these rules), govern Class II injection operations in the affected area described below:

**Affected Area: Umiat Meridian**

<u>Township and Range</u>	<u>Sections</u>
T10N R12E	Sections 1 through 4: All Sections 10 through 12: All
T10N R13E	Sections 1 through 16: All Section 24: All
T10N R14E	Sections 5 through 8: All Sections 17 through 20: All
T11N R11E	Sections 1 through 4: All Sections 9 through 15: All Sections 24 and 25: All
T11N R12E	Entire Township
T11N R13E	Entire Township
T11N R14E	Sections 3 through 8: All Sections 17 through 20: All Sections 29 through 32: All
T12N R10E	Sections 13 and 24: All

T12N R11E	Sections 9 through 30: All Sections 32 through 36: All
T12N R12E	Section 7: All Section 17 through 36: All
T12N R13E	Sections 19 through 23: All Sections 26 through 36: All
T12N R14E	Sections 27 through 29: All Sections 31 through 34: All

**Rule 1. Authorized Injection Strata for Enhanced Recovery(Source: AIO 3A.002 and Revised This Order)**

Within the affected area and in the strata defined as those strata which correlate with the strata found in ARCO Alaska Inc. (Atlantic-Richfield-Humble) Prudhoe Bay State Well No. 1 between the measured depths of 8110 feet and 8680 feet the following fluids may be injected for purposes of pressure maintenance and enhanced oil recovery:

- (a) Produced water and gas from Prudhoe Bay Unit processing facilities;
- (b) CO<sub>2</sub> and other GTP effluent gases from sources within or outside the Prudhoe Bay Unit;
- (c) Enriched hydrocarbon gas;
- (d) Non-hazardous water and water based fluids – (specifically seawater, source water, freshwater, domestic wastewater, equipment washwater, sump fluids, hydrotest fluids, firewater, and water with trace chemicals, and other water based fluids with a pH greater than 2 and less than 12.5 and flashpoint greater than 140 degrees F);
- (e) Fluids introduced to production facilities for the purpose of oil production, plant operations, plant/piping integrity or well maintenance that become entrained in the produced water stream after oil, gas, and water separation in the facility. Specifically:
  - i. Freeze protection fluids;
  - ii. Fluids in mixtures of oil sent for hydrocarbon recycle;
  - iii. Corrosion/scale inhibitor fluids;
  - iv. Anti-foams/emulsion breakers;
  - v. Glycols;
  - vi. Radioactive tracer survey fluids
- (f) Non-hazardous glycols and glycol mixtures;
- (g) Fluids that are used for their intended purpose within the oil production process. Specifically:
  - i. Scavengers;
  - ii. Biocides
- (h) Fluids to monitor or enhance reservoir performance. Specifically:
  - i. Tracer survey fluids;
  - ii. Well stimulation fluids;
  - iii. Reservoir profile modification fluids.

**Rule 2 Authorized Injection Strata for Disposal (Source: AIO 3.001)**

Within the affected area, non-hazardous oil field fluids may be injected for the purpose of fluid disposal into strata defined as those strata which correlate with the strata found in SAPC's Prudhoe Bay Unit Well No. C-11 between the measured depths of 3416 feet and 6293 feet.

**Rule 3. Fluid Injection Wells (Source: AIO 3)**

The underground injection of fluids must be:

- (i) through a new well that has been permitted for drilling as a service well for injection in conformance with 20 AAC 25.005;
- (ii) through an existing well that has been approved for conversion to a service well for injection in conformance with 20 AAC 25.280; or
- (iii) through a well that existed as a service well for injection purposes on the date of July 11, 1986

Pumping of excess non-hazardous fluids that are developed solely from well operations or necessary to control the fluid level of reserve pits, into surface/production casing annuli is exempted from the above requirements.

**Rule 4. Monitoring the Tubing-Casing Annulus Pressure Variations (Source: AIO 3A)**

The tubing by casing annulus pressure and injection rate of each injection well must be checked at least weekly to confirm continued mechanical integrity.

**Rule 5. Reporting the Tubing/Casing Annulus Pressure Variations (Rescinded: AIO 3A)**

**Rule 6. Demonstration of Tubing-Casing Annulus Mechanical Integrity (Source: AIO 3A)**

The mechanical integrity of an injection well must be demonstrated before injection begins, and before returning a well to service following a workover affecting mechanical integrity. An AOGCC-witnessed mechanical integrity test must be performed after injection is commenced for the first time in a well, to be scheduled when injection conditions (temperature, pressure, rate, etc.) have stabilized. Subsequent tests must be performed at least once every four years thereafter (except at least once every two years in the case of a slurry injection well). The AOGCC must be notified at least 24 hours in advance to enable a representative to witness mechanical integrity tests. Unless an alternate means is approved by the AOGCC, mechanical integrity must be demonstrated by a tubing by casing annulus pressure test using a surface pressure of 1500 psi or 0.25 psi/ft multiplied by the vertical depth of the packer, whichever is greater, that shows stabilizing pressure and does not change more than 10 percent during a 30-minute period. Results of mechanical integrity tests must be readily available for AOGCC inspection.

**Rule 7. Well Integrity Failure (Source: AIO 3A)**

Whenever any pressure communication, leakage or lack of injection zone isolation is indicated by injection rate, operating pressure observation, test, survey, log, or other evidence, the Operator shall notify the AOGCC by the next business day and submit a plan of corrective action on a Form 10-403 for AOGCC approval. The Operator shall immediately shut in the well if continued operation would be unsafe or would threaten contamination of freshwater, or if so directed by the AOGCC. A monthly report of daily tubing and casing annuli pressures and

injection rates must be provided to the AOGCC for all injection wells indicating well integrity failure or lack of injection zone isolation.

**Rule 8. Plugging and Abandonment of Fluid Injection Wells (Source: AIO 3)**

An injection well located within the affected area must not be plugged or abandoned unless approved by the AOGCC.

**Rule 9. Wells Authorized for Downhole Commingled Injection with the Aurora Oil Pool (Source: AIO 3.010 and AIO 3A)**

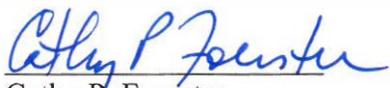
Injection into the AOP and POP within the same wellbore is authorized for wells PBU S-09 and S-31A, subject to the following conditions.

- (a) An approved Application for Sundry Approval (Form 10-403) is required for each well prior to commencement of commingled injection.
- (b) Within 60 days of commencement of commingled injection in a well, or switching from one injection fluid to the other, BPXA must conduct an injection survey to determine the proper allocation of injected fluids. Additional injection surveys shall be conducted on each well at least once per year thereafter as long as the well continues commingled injection.
- (c) Annual and total cumulative volumes injected by pool and results of logs or surveys used for determining the allocation of injected fluids between pools must be supplied in the Annual Surveillance Report for the AOP.

**Rule 10. Administrative Relief (Revised this order)**

Upon proper application, or its own motion, and unless notice and public hearing are otherwise required, the AOGCC may administratively waive the requirements of any rule stated herein or administratively amend this order as long as the change does not promote waste or jeopardize correlative rights, is based on sound engineering and geoscience principles, and will not result in an increased risk of fluid movement into freshwater.

**DONE** at Anchorage, Alaska and dated October 15, 2015.

  
Cathy P. Foerster  
Chair, Commissioner

  
Daniel T. Seamount, Jr.  
Commissioner



**RECONSIDERATION AND APPEAL NOTICE**

As provided in AS 31.05.080(a), within **20** days after written notice of the entry of this order or decision, or such further time as the AOGCC grants for good cause shown, a person affected by it may file with the AOGCC an application for reconsideration of the matter determined by it. If the notice was mailed, then the period of time shall be **23** days. An application for reconsideration must set out the respect in which the order or decision is believed to be erroneous.

The AOGCC shall grant or refuse the application for reconsideration in whole or in part within 10 days after it is filed. Failure to act on it within 10-days is a denial of reconsideration. If the AOGCC denies reconsideration, upon denial, this order or decision and the denial of reconsideration are **FINAL** and may be appealed to superior court. The appeal **MUST** be filed within **33** days after the date on which the AOGCC mails, **OR 30** days if the AOGCC otherwise distributes, the order or decision denying reconsideration, **UNLESS** the denial is by inaction, in which case the appeal **MUST** be filed within **40** days after the date on which the application for reconsideration was filed.

If the AOGCC grants an application for reconsideration, this order or decision does not become final. Rather, the order or decision on reconsideration will be the **FINAL** order or decision of the AOGCC, and it may be appealed to superior court. That appeal **MUST** be filed within **33** days after the date on which the AOGCC mails, **OR 30** days if the AOGCC otherwise distributes, the order or decision on reconsideration.

In computing a period of time above, the date of the event or default after which the designated period begins to run is not included in the period; the last day of the period is included, unless it falls on a weekend or state holiday, in which event the period runs until 5:00 p.m. on the next day that does not fall on a weekend or state holiday.